

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Guttersen 31Y-301**

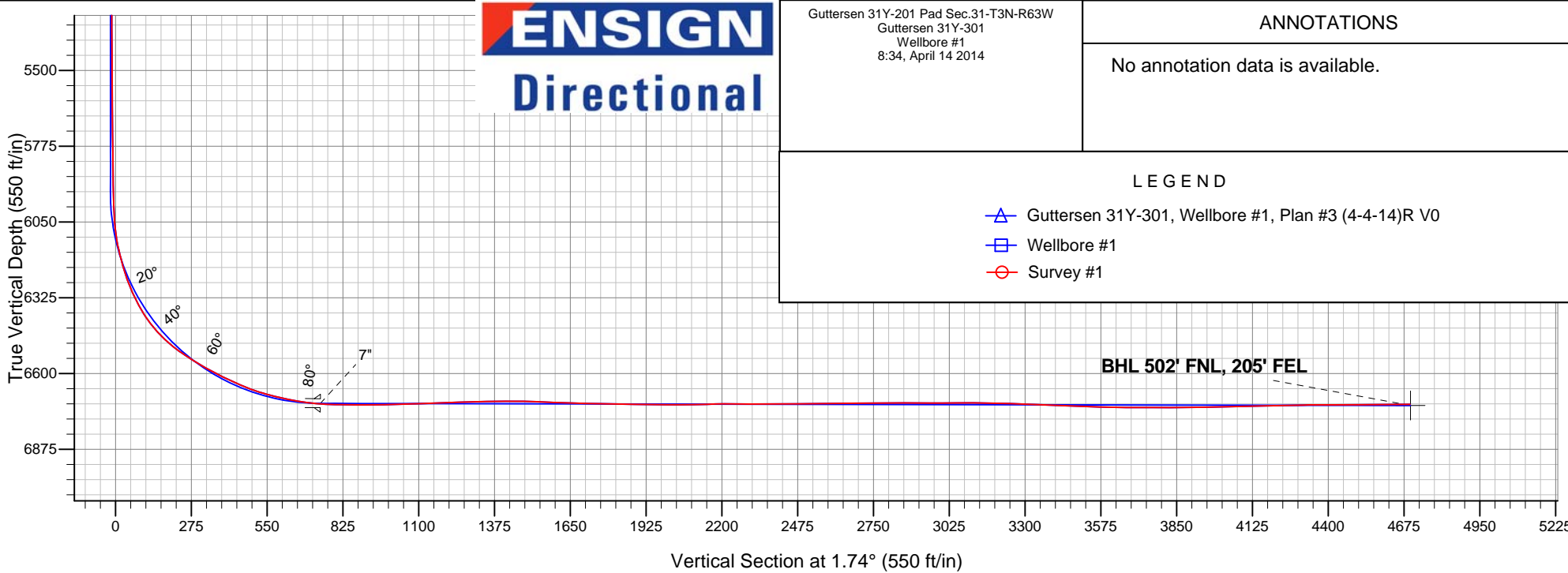
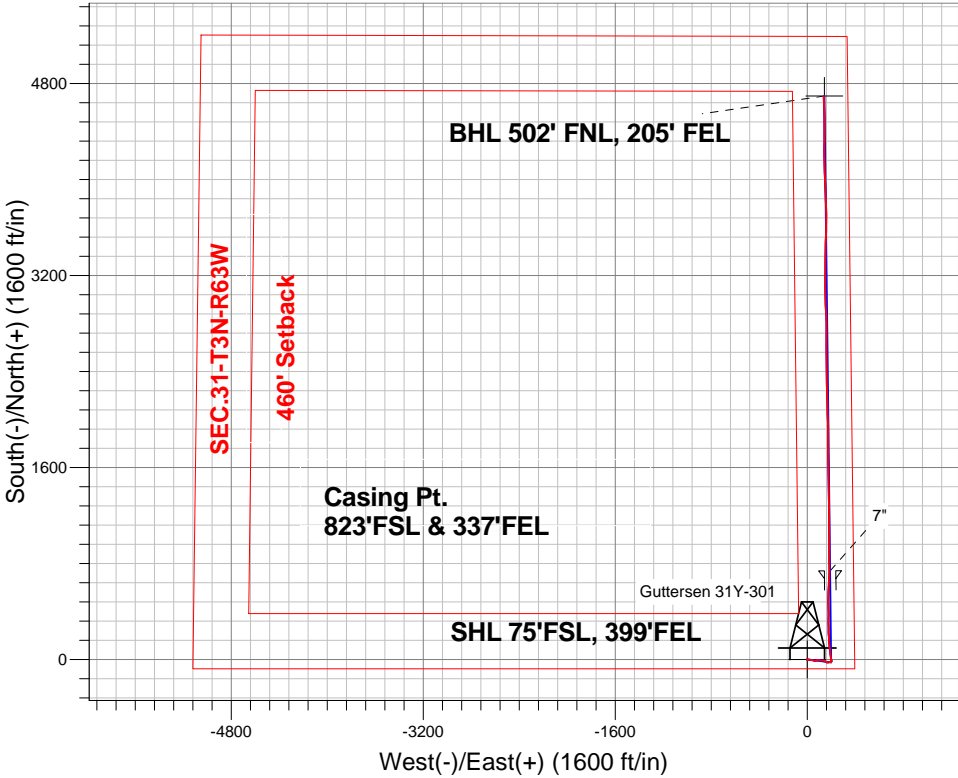
Surface Location: Guttersen 31Y-201 Pad Sec.31-T3N-R63W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

Ground Elevation: 4836.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1308211.95	3287155.18	40.174870	-104.472350	
Ensign 136 RKB - 12.5' WELL @ 4848.5ft (Ensign 136 RKB - 12.5')						

FINAL SURVEY

Projected Bottom Hole Location
11111'MD 6712'TVD 4694'N & 138'E of SHL
91.0 degree Incl @ 358.1 degree AZM



Guttersen 31Y-201 Pad Sec.31-T3N-R63W Guttersen 31Y-301 Wellbore #1 8:34, April 14 2014	ANNOTATIONS
	No annotation data is available.
LEGEND	
△ Guttersen 31Y-301, Wellbore #1, Plan #3 (4-4-14)R V0	
□ Wellbore #1	
○ Survey #1	



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.31-T3N-R63W

Guttersen 31Y-201 Pad Sec.31-T3N-R63W

Guttersen 31Y-301

Wellbore #1

Survey: Survey #1

Standard Survey Report

14 April, 2014

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Gutteresen 31Y-301
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4848.5ft (Ensign 136 RKB - 12.5')
Site:	Gutteresen 31Y-201 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4848.5ft (Ensign 136 RKB - 12.5')
Well:	Gutteresen 31Y-301	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.31-T3N-R63W, Weld County, Colorado		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site		Guttersen 31Y-201 Pad Sec.31-T3N-R63W			
Site Position:		Northing:	1,308,211.98ft	Latitude:	40.174870
From:	Lat/Long	Easting:	3,287,155.18ft	Longitude:	-104.472350
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.66 °

Well	Gutteresen 31Y-301					
Well Position	+N-S	0.0 ft	Northing:	1,308,211.95 ft	Latitude:	40.174870
	+E-W	0.0 ft	Easting:	3,287,155.18 ft	Longitude:	-104.472350
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,836.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	4/3/2014	8.31	66.82	52,749

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	1.74	

Survey Program	Date	4/14/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
43.0	11,111.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
1.0	0.01	258.80	1.0	0.0	0.0	0.0	0.93	0.93	0.00	
SHL 75'FSL, 399'FEL										
43.0	0.40	258.80	43.0	0.0	-0.1	0.0	0.93	0.93	0.00	
132.0	0.40	256.00	132.0	-0.2	-0.8	-0.2	0.02	0.00	-3.15	
222.0	0.40	265.30	222.0	-0.3	-1.4	-0.3	0.07	0.00	10.33	
317.0	0.40	260.70	317.0	-0.3	-2.0	-0.4	0.03	0.00	-4.84	
407.0	0.50	272.50	407.0	-0.4	-2.7	-0.5	0.15	0.11	13.11	
498.0	0.40	272.30	498.0	-0.4	-3.4	-0.5	0.11	-0.11	-0.22	
588.0	1.20	98.50	588.0	-0.5	-2.8	-0.6	1.78	0.89	-193.11	
679.0	2.60	92.20	678.9	-0.7	0.2	-0.7	1.55	1.54	-6.92	
770.0	4.10	94.30	769.8	-1.0	5.5	-0.9	1.65	1.65	2.31	

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Site:	Gutteresen 31Y-201 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4848.5ft (Ensign 136 RKB - 12.5')
Well:	Gutteresen 31Y-301	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
854.0	4.50	97.30	853.5	-1.7	11.7	-1.3	0.55	0.48	3.57
931.0	5.20	99.40	930.3	-2.6	18.2	-2.1	0.94	0.91	2.73
1,027.0	4.00	99.50	1,025.9	-3.9	25.8	-3.1	1.25	-1.25	0.10
1,119.0	4.10	98.80	1,117.7	-4.9	32.2	-3.9	0.12	0.11	-0.76
1,210.0	4.40	99.50	1,208.5	-6.0	38.9	-4.8	0.33	0.33	0.77
1,300.0	4.60	101.60	1,298.2	-7.3	45.8	-5.9	0.29	0.22	2.33
1,391.0	4.40	103.10	1,388.9	-8.8	52.8	-7.2	0.25	-0.22	1.65
1,482.0	4.60	106.90	1,479.6	-10.7	59.7	-8.8	0.39	0.22	4.18
1,573.0	2.90	67.20	1,570.4	-10.8	65.3	-8.8	3.30	-1.87	-43.63
1,664.0	2.90	76.50	1,661.3	-9.4	69.6	-7.3	0.52	0.00	10.22
1,755.0	2.60	71.80	1,752.2	-8.2	73.8	-6.0	0.41	-0.33	-5.16
1,845.0	4.50	79.30	1,842.0	-6.9	79.2	-4.5	2.17	2.11	8.33
1,936.0	4.10	82.10	1,932.8	-5.8	86.0	-3.2	0.50	-0.44	3.08
2,027.0	4.60	100.60	2,023.5	-6.0	92.8	-3.2	1.63	0.55	20.33
2,118.0	4.30	99.50	2,114.3	-7.3	99.7	-4.2	0.34	-0.33	-1.21
2,210.0	4.20	93.00	2,206.0	-8.0	106.5	-4.8	0.53	-0.11	-7.07
2,305.0	4.40	85.30	2,300.7	-7.9	113.6	-4.5	0.64	0.21	-8.11
2,400.0	3.10	102.40	2,395.5	-8.2	119.7	-4.5	1.79	-1.37	18.00
2,496.0	2.90	84.10	2,491.4	-8.5	124.7	-4.7	1.01	-0.21	-19.06
2,591.0	3.70	83.90	2,586.3	-7.9	130.1	-3.9	0.84	0.84	-0.21
2,686.0	3.90	110.10	2,681.0	-8.7	136.2	-4.5	1.82	0.21	27.58
2,781.0	4.00	128.20	2,775.8	-11.8	141.9	-7.5	1.31	0.11	19.05
2,876.0	4.00	119.80	2,870.6	-15.5	147.3	-11.1	0.62	0.00	-8.84
2,972.0	4.20	121.00	2,966.4	-19.0	153.3	-14.3	0.23	0.21	1.25
3,067.0	4.00	124.90	3,061.1	-22.7	159.0	-17.9	0.36	-0.21	4.11
3,162.0	3.20	88.80	3,155.9	-24.5	164.3	-19.5	2.48	-0.84	-38.00
3,257.0	2.60	84.60	3,250.8	-24.3	169.1	-19.1	0.67	-0.63	-4.42
3,353.0	2.40	86.90	3,346.7	-24.0	173.3	-18.7	0.23	-0.21	2.40
3,448.0	2.70	79.00	3,441.6	-23.4	177.5	-18.0	0.49	0.32	-8.32
3,543.0	2.40	81.30	3,536.5	-22.7	181.6	-17.2	0.33	-0.32	2.42
3,638.0	2.30	76.50	3,631.5	-22.0	185.5	-16.3	0.23	-0.11	-5.05
3,733.0	2.40	73.30	3,726.4	-20.9	189.2	-15.2	0.17	0.11	-3.37
3,829.0	2.10	82.10	3,822.3	-20.1	192.9	-14.3	0.48	-0.31	9.17
3,924.0	1.90	70.90	3,917.2	-19.4	196.1	-13.4	0.46	-0.21	-11.79
4,019.0	1.90	67.70	4,012.2	-18.2	199.0	-12.2	0.11	0.00	-3.37
4,114.0	0.60	261.30	4,107.2	-17.7	200.0	-11.7	2.62	-1.37	-175.16
4,210.0	0.50	258.30	4,203.2	-17.9	199.1	-11.8	0.11	-0.10	-3.13
4,304.0	0.60	302.70	4,297.2	-17.7	198.3	-11.7	0.45	0.11	47.23
4,400.0	0.60	280.10	4,393.2	-17.3	197.4	-11.4	0.24	0.00	-23.54
4,495.0	0.90	109.00	4,488.2	-17.5	197.6	-11.5	1.57	0.32	-180.11
4,590.0	0.40	74.10	4,583.2	-17.7	198.6	-11.6	0.65	-0.53	-36.74
4,685.0	0.30	198.70	4,678.1	-17.8	198.8	-11.8	0.65	-0.11	131.16
4,781.0	0.40	267.80	4,774.1	-18.0	198.4	-12.0	0.42	0.10	71.98
4,876.0	0.10	236.80	4,869.1	-18.1	198.0	-12.1	0.34	-0.32	-32.63
4,971.0	0.40	229.80	4,964.1	-18.4	197.7	-12.4	0.32	0.32	-7.37
5,066.0	0.70	243.00	5,059.1	-18.8	196.9	-12.9	0.34	0.32	13.89
5,162.0	0.40	210.10	5,155.1	-19.4	196.2	-13.4	0.44	-0.31	-34.27
5,257.0	0.20	170.20	5,250.1	-19.8	196.1	-13.9	0.29	-0.21	-42.00
5,352.0	0.30	61.70	5,345.1	-19.9	196.4	-13.9	0.43	0.11	-114.21
5,447.0	0.40	34.30	5,440.1	-19.5	196.8	-13.5	0.20	0.11	-28.84
5,542.0	0.60	53.10	5,535.1	-18.9	197.3	-12.9	0.27	0.21	19.79
5,638.0	0.80	51.00	5,631.1	-18.2	198.3	-12.2	0.21	0.21	-2.19
5,733.0	0.80	36.60	5,726.1	-17.3	199.2	-11.2	0.21	0.00	-15.16
5,828.0	0.80	28.20	5,821.1	-16.1	199.9	-10.1	0.12	0.00	-8.84

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
5,923.0	1.10	27.60	5,916.1	-14.7	200.6	-8.7	0.32	0.32	-0.63
5,955.0	1.20	33.30	5,948.1	-14.2	201.0	-8.1	0.47	0.31	17.81
5,987.0	1.60	16.60	5,980.1	-13.5	201.3	-7.4	1.77	1.25	-52.19
6,018.0	2.80	356.50	6,011.1	-12.3	201.3	-6.2	4.55	3.87	-64.84
6,050.0	4.20	352.50	6,043.0	-10.4	201.1	-4.3	4.44	4.38	-12.50
6,082.0	6.40	350.70	6,074.9	-7.5	200.7	-1.4	6.89	6.88	-5.63
6,114.0	9.10	349.50	6,106.6	-3.2	200.0	2.9	8.45	8.44	-3.75
6,145.0	12.00	348.80	6,137.0	2.4	198.9	8.4	9.36	9.35	-2.26
6,177.0	13.90	351.30	6,168.2	9.4	197.6	15.4	6.19	5.94	7.81
6,210.0	15.50	351.30	6,200.1	17.7	196.4	23.7	4.85	4.85	0.00
6,241.0	17.90	353.00	6,229.8	26.5	195.2	32.4	7.90	7.74	5.48
6,273.0	20.10	353.20	6,260.1	36.9	193.9	42.7	6.88	6.88	0.63
6,304.0	22.90	352.70	6,288.9	48.2	192.5	54.0	9.05	9.03	-1.61
6,337.0	25.20	352.10	6,319.1	61.5	190.7	67.2	7.01	6.97	-1.82
6,368.0	28.10	352.30	6,346.8	75.3	188.9	80.9	9.36	9.35	0.65
6,400.0	31.40	353.40	6,374.5	91.0	186.9	96.6	10.45	10.31	3.44
6,432.0	35.10	355.00	6,401.3	108.5	185.1	114.0	11.88	11.56	5.00
6,464.0	38.90	354.60	6,426.8	127.6	183.4	133.1	11.90	11.88	-1.25
6,495.0	42.60	355.10	6,450.3	147.8	181.6	153.2	11.98	11.94	1.61
6,527.0	46.30	357.10	6,473.2	170.1	180.1	175.5	12.36	11.56	6.25
6,559.0	50.20	357.90	6,494.5	194.0	179.0	199.3	12.33	12.19	2.50
6,591.0	53.20	358.50	6,514.3	219.1	178.2	224.4	9.49	9.38	1.88
6,623.0	56.20	358.50	6,532.8	245.2	177.6	250.5	9.38	9.38	0.00
6,654.0	58.10	359.00	6,549.6	271.2	177.0	276.5	6.28	6.13	1.61
6,686.0	60.10	359.70	6,566.0	298.7	176.7	303.9	6.53	6.25	2.19
6,718.0	62.00	0.20	6,581.5	326.7	176.7	331.9	6.09	5.94	1.56
6,750.0	62.30	0.40	6,596.5	355.0	176.8	360.2	1.09	0.94	0.63
6,781.0	62.60	359.90	6,610.8	382.5	176.9	387.6	1.73	0.97	-1.61
6,813.0	64.10	359.00	6,625.2	411.1	176.6	416.2	5.32	4.69	-2.81
6,845.0	66.20	358.30	6,638.6	440.1	175.9	445.2	6.86	6.56	-2.19
6,877.0	68.90	358.60	6,650.8	469.6	175.1	474.7	8.48	8.44	0.94
6,908.0	71.30	0.00	6,661.4	498.8	174.8	503.9	8.83	7.74	4.52
6,940.0	73.80	1.30	6,671.0	529.3	175.1	534.4	8.72	7.81	4.06
6,972.0	75.60	2.50	6,679.4	560.2	176.1	565.2	6.69	5.63	3.75
7,004.0	76.80	3.00	6,687.1	591.2	177.6	596.3	4.05	3.75	1.56
7,035.0	78.10	3.40	6,693.8	621.4	179.3	626.6	4.38	4.19	1.29
7,067.0	80.00	3.20	6,699.9	652.8	181.1	658.0	5.97	5.94	-0.63
7,098.0	82.40	2.00	6,704.6	683.4	182.5	688.6	8.64	7.74	-3.87
7,163.0	87.10	359.90	6,710.6	748.1	183.6	753.3	7.91	7.23	-3.23
7,253.0	89.30	358.80	6,713.4	838.0	182.6	843.2	2.73	2.44	-1.22
7,344.0	90.90	0.40	6,713.2	929.0	181.9	934.1	2.49	1.76	1.76
7,435.0	91.30	359.90	6,711.5	1,020.0	182.2	1,025.0	0.70	0.44	-0.55
7,526.0	91.90	0.00	6,708.9	1,110.9	182.1	1,116.0	0.67	0.66	0.11
7,617.0	92.20	359.30	6,705.7	1,201.9	181.5	1,206.8	0.84	0.33	-0.77
7,708.0	91.50	359.20	6,702.7	1,292.8	180.3	1,297.7	0.78	-0.77	-0.11
7,799.0	91.00	359.00	6,700.8	1,383.8	178.9	1,388.6	0.59	-0.55	-0.22
7,890.0	88.90	358.60	6,700.8	1,474.8	177.0	1,479.5	2.35	-2.31	-0.44
7,985.0	87.90	359.20	6,703.5	1,569.7	175.2	1,574.3	1.23	-1.05	0.63
8,080.0	87.40	359.30	6,707.4	1,664.6	173.9	1,669.1	0.54	-0.53	0.11
8,175.0	89.40	0.40	6,710.0	1,759.6	173.7	1,764.0	2.40	2.11	1.16
8,271.0	89.10	359.70	6,711.3	1,855.6	173.8	1,860.0	0.79	-0.31	-0.73
8,366.0	89.20	358.80	6,712.7	1,950.6	172.5	1,954.9	0.95	0.11	-0.95
8,461.0	90.30	358.60	6,713.1	2,045.5	170.4	2,049.8	1.18	1.16	-0.21

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
8,556.0	91.80	359.30	6,711.4	2,140.5	168.6	2,144.6	1.74	1.58	0.74
8,651.0	90.00	357.40	6,709.9	2,235.4	165.9	2,239.4	2.75	-1.89	-2.00
8,747.0	89.50	358.30	6,710.3	2,331.4	162.3	2,335.2	1.07	-0.52	0.94
8,842.0	91.00	359.70	6,709.9	2,426.3	160.6	2,430.1	2.16	1.58	1.47
8,937.0	89.40	359.20	6,709.6	2,521.3	159.7	2,525.0	1.76	-1.68	-0.53
9,032.0	91.50	0.90	6,708.8	2,616.3	159.8	2,620.0	2.84	2.21	1.79
9,128.0	90.10	0.20	6,707.5	2,712.3	160.7	2,715.9	1.63	-1.46	-0.73
9,223.0	91.10	358.60	6,706.5	2,807.3	159.7	2,810.8	1.99	1.05	-1.68
9,318.0	88.80	356.40	6,706.6	2,902.2	155.6	2,905.6	3.35	-2.42	-2.32
9,413.0	90.60	359.30	6,707.1	2,997.1	152.0	3,000.3	3.59	1.89	3.05
9,508.0	89.60	358.30	6,706.9	3,092.1	150.0	3,095.2	1.49	-1.05	-1.05
9,604.0	89.10	0.00	6,708.0	3,188.1	148.6	3,191.1	1.85	-0.52	1.77
9,699.0	88.00	1.30	6,710.4	3,283.0	149.7	3,286.1	1.79	-1.16	1.37
9,794.0	87.70	1.30	6,714.0	3,377.9	151.8	3,381.0	0.32	-0.32	0.00
9,889.0	87.40	1.60	6,718.0	3,472.8	154.2	3,475.9	0.45	-0.32	0.32
9,984.0	88.60	1.30	6,721.3	3,567.7	156.6	3,570.8	1.30	1.26	-0.32
10,079.0	89.40	0.00	6,723.0	3,662.7	157.7	3,665.8	1.61	0.84	-1.37
10,175.0	90.20	358.60	6,723.3	3,758.7	156.6	3,761.7	1.68	0.83	-1.46
10,270.0	89.90	358.80	6,723.2	3,853.7	154.4	3,856.6	0.38	-0.32	0.21
10,365.0	91.60	357.20	6,722.0	3,948.6	151.1	3,951.4	2.46	1.79	-1.68
10,460.0	91.30	356.90	6,719.6	4,043.4	146.2	4,046.0	0.45	-0.32	-0.32
10,556.0	90.70	358.80	6,717.9	4,139.3	142.6	4,141.8	2.08	-0.63	1.98
10,702.0	91.70	0.40	6,714.9	4,285.3	141.6	4,287.6	1.29	0.68	1.10
10,746.0	90.50	0.60	6,714.0	4,329.3	142.0	4,331.6	2.76	-2.73	0.45
10,841.0	90.00	0.20	6,713.6	4,424.3	142.6	4,426.6	0.67	-0.53	-0.42
10,936.0	90.20	359.00	6,713.4	4,519.3	142.0	4,521.5	1.28	0.21	-1.26
11,111.0	91.00	358.10	6,711.6	4,694.2	137.5	4,696.2	0.69	0.46	-0.51
BHL 500' FNL, 200' FEL									

Checked By: _____	Approved By: _____	Date: _____
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